DuraJet

Struers

Bench-top Hardness Tester with extended load range for Rockwell, Superficial Rockwell Testing, Plastics Testing and HVT/HBT

Very easy to operate due to touch-screen and intuitive software

The DuraJet is a table top Rockwell tester capable of testing with all Rockwell and Superficial Rockwell methods and has the fastest test cycle time of all Rockwell testers on the market.

Basic features include:

- Wide test load range from 49 to 1839 N (or 5 to 187.5 kgf, main loads), facilitating multiple test methods. Capable of testing with all Rockwell and Superficial Rockwell Methods
- Load cell technology ensuring highest degree of accuracy and repeatability
- Vertical movement of test head for improved capacity and optimal stability. Vertical capacity: 260 mm
- Extremely fast cycle time
- Automatic start once nose cone clamps the sample, with subsequent automatic unclamping (selectable)
- Capable of performing tests without nose cone - useful for uneven sample geometries
- Easily controlled via large (4.7") touch screen panel and intuitive software interface
- Built-in statistical functions
- Test method conversion according to EN ISO 18265, DIN 50150, ASTM E140
- Easy parameter input and test method management
- Template management for easy recall of test methods
- Network integration possibilities and export functions via the USB and serial ports (RS232). For report generation as well as improved data management and traceability
- Printer can be connected directly to USB port for easy reporting. Report can be modified via customisable user fields
- Available with following languages pre-installed: English, German, French, Spanish, Italian, Japanese and Chinese

Innovative closed-loop technology

The test load is applied via a closed-loop control unit with a load cell, a DC motor and an electronic measurement and control unit. The result is highly accurate measurements at all test loads. The common load overshoot or undershoot as known from traditional dead weight, or open-loop, systems is eliminated. The absence of mechanical weights not only eliminates friction problems but also makes the equipment less sensitive to misalignments caused by vibrations. DuraJet not only conforms to all standards but offers higher accuracy, ensuring a future proof unit.

Wide application range

DuraJet is designed specifically for the laboratory or quality control station that is looking to eliminate operator influences, thus assuring the highest repeatability. Basic bench top testers are based on dead weight or spring load systems and are usually limited to a few of the Rockwell methods only. Due to the load cell technology, the DuraJet is however not limited to a few loads only but is capable of testing all Rockwell and Superficial Rockwell scales, Ball Indentation Hardness according to ISO 2039, as well as HVT and HBT (Vickers Depth Difference Measurement and Brinell Depth Difference Measurement). The loads are applied automatically and the test cycle is carried out fully automatically.

Rigid frame

The DuraJet hardness tester is engineered around a sturdy cast iron frame and supplied with a 180 x 185 mm fixed test anvil. This ensures optimal testing conditions without the result being influenced by a spindle.

The DuraJet is designed with a fixed test anvil and a motorized test head for improved capacity and optimal stability

Vertical test head

The DuraJet is based on a vertical test head concept with a fixed test anvil and moveable, motorised test head. The fixed test anvil provides a more stable support, ensuring more accurate and repeatable test conditions and the motorised test head facilitates easier testing of large and heavy samples as no manual movement of the support anvil is required. The vertical capacity is 260 mm and the throat depth is 175 mm.

Time saving automatic test cycles

The entire test cycle of applying load, unloading and hardness read-out is performed fully automatic. This greatly improves reproducibility as operator influence is eliminated.

Automatic start and unclamping

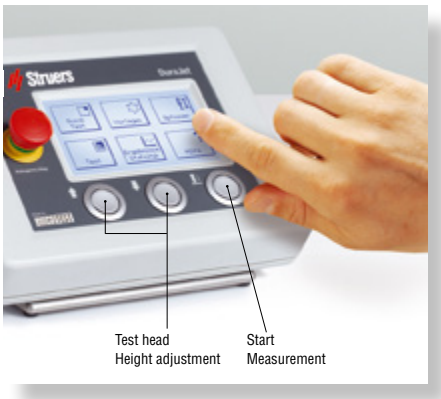
With DuraJet you have the possibility of selecting an automatic start of the test cycle once the nose cone drives into and touches the sample. You can also select that the nose cone automatically retracts (unclamps) to a certain distance, for instance 5 mm, once the test cycle has finished. The operator therefore does not have to drive the test anvil or up or down before and after each test, greatly simplifying the testing and saving you significant amounts of time. This feature is particularly suitable if you are performing high volume testing of similar sample types, for instance as part of an inspection job.

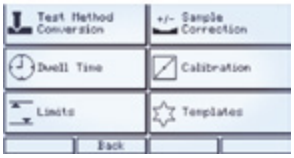
Intuitive touch screen operation

A large LCD touch screen and intuitive pull-down menus ensure very easy operation. Hardness data can be saved for statistical evaluation and reporting.

The integrated DuraJet software control includes:

- Quick test
- Test
- Hardness conversion
- Statistics
- Measurement templates
- Reporting/printing functions
- Export function





The LCD touch screen and intuitive menus ensure easy operation

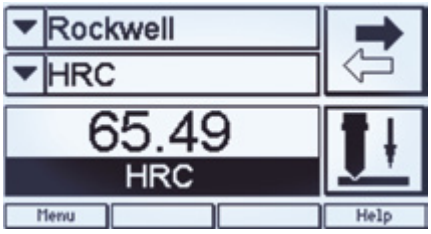
The DuraJet allows for testing directly on cylindrical and round surfaces

Quick Test and Test

The software allows for two testing modes – the “Quick Test” mode and the normal "Test" mode.

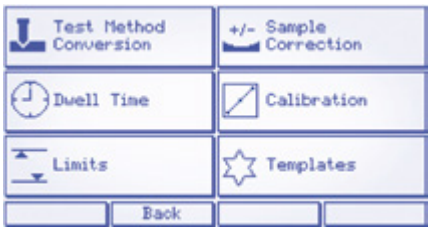
The *Quick Test* is a basic test with default basic settings used if you just need a fast hardness test, and don’t have a need to change various testing parameters such as dwell time, hardness limits etc. It therefore saves the operator time as he can set up and execute new test runs just by one or two selections - and still conform to the international standards.

With the *Test* mode you have the possibility to modify the default testing parameters, such as the applied Hardness conversion, dwell time, hardness limits, correction factors for cylindrical samples, as well as manage measurement data and templates, and export test results.



Quick Test

Test



Settings, Test

Hardness conversion

The newest hardness conversion standards demand material dependent conversions. This means that applied conversion tables should be according to the sample material, as converted values otherwise can vary. The DuraJet software however allows you to select and choose between these various conversion tables according to your material and thus fully conform to the international standards.

Convex surface correction

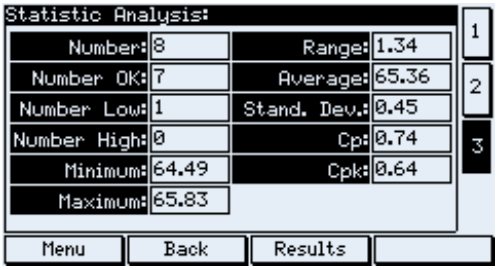
DuraJet offers you the possibility to apply correction factors on samples with convex surface, such as cylinders and spheres (balls). The input of the diameter of the sample automatically results in the corrected hardness value.

Built-in statistical functions

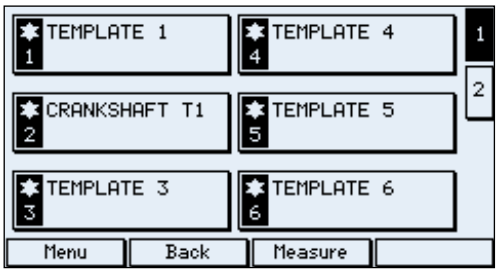
The DuraJet allows for statistic evaluation and analysis, both by displaying basic statistical values such as min./max. values, range, average, standard deviation, Cp, Cpk, but also by graphically displaying the data via trend lines and bar charts. If you want to perform more advanced analysis, you can always export the measurement data to an Excel file and analyse it in the calm of your office.

Template management for easy recall of test methods and traceability of results

If you test different sample types and therefore require different settings - for instance hardness methods with different hardness limits or hardness correction factors - you can save the various settings in corresponding measurement templates. It will significantly simplify the set-up and testing of your various sample types and will also allow for increased traceability of measured test results, as the used template can be displayed in the test report.



Built-in statistical analysis



Template management for easy storage and recall of test methods

Network integration, data export and reporting

The DuraJet is equipped with LAN and USB ports for easy connection to additional devices. The communication ports allow you to export data files for instance to a PC or USB flash disk (.csv, .txt), or to connect a printer for easy reporting. Via a USB-RS232 adapter, serial devices can also be connected. Furthermore the integrated reporting function allows for modification of report information via customisable user fields, as well as exchange of logo, thereby adapting to your particular requirements.

Accessories

A wide range of indenters and additional anvils in various sizes and shapes are available. See the following pages for details.

The DuraJet is equipped with an USB port for connection of additional devices

Technical data

Dimensions:	Basic machine: 300 x 562 x 740 mm (W x D x H)
Control panel:	230 x 175 mm
Touch screen, display:	4.7" (240 x 128 Pixels)
Test Anvil:	180 x 185 mm
Weight of machine:	110 kg
Power Supply:	110/230V AC
Test Load Range (main loads):	5-187.5 kgf (49.03 N-1839 N)
Communication Ports:	1 x USB 1.1, 1 x RJ45 LAN (for service), 1 x Serial RS232 (for control panel)
Max. sample height:	260 mm
Throat depth:	175 mm
Max. sample weight:	100 kg

Specifications

	Cat. no:
DuraJet Rockwell Hardness Tester	EMDJ10
Rockwell Hardness Tester with LCD Touch screen display. For all Rockwell methods, Ball Indentation Hardness (ISO 2039-1), HVT and HBT. Test load range (main loads): 5-187.5 kgf (49-1839 N). Vertical moveable test head (motorised) and plane test anvil 180 x 185 mm (fixed). Max sample height 260 mm, throat depth 175 mm. Including standard nose cone insert EMK01. Excluding indenter.	

Accessories

Standard Indenters	**Cat. no:**
Rockwell indenter, diamond, with accredited certificate. For HRA/HRC/HRD & HR15/30/45N	EMNDR28007Z
Rockwell indenter, 1/16" ball, with accredited certificate. For HRB/HRF/HRG & HR15/30/45T	EMNKW28E16Z
Rockwell indenter 1/8" ball. 28 mm x 6½ mm dia. For HRE/HRH/HRK & HR15/30/45W	EMNKW28E18U
Rockwell indenter 1/4" ball. 28 mm x 9 mm dia. For HRL/HRM/HRP & HR15/30/45X	EMNKW28E14U*
Rockwell indenter 1/2" ball. 28 mm x 15 mm dia. For HRR/HRS/HRV & HR15/30/45Y	EMNKW28E12U**
Vickers indenter ≥HV5, with accredited certificate.	EMNDV28007Z
Brinell indenter, 1 mm carbide ball, with accredited certificate.	EMNKW28E01Z
Brinell indenter, 2.5 mm carbide ball, with accredited certificate.	EMNKW28E02Z
Brinell indenter, 5 mm carbide ball, with accredited certificate.	EMNKW28E05Z

Accredited certificates are issued by MPA/DKD Germany according to EN ISO. ASTM certificates on request.

**Nose cone insert EMK03 is required.*
***Nose cone insert EMK04 is required.*

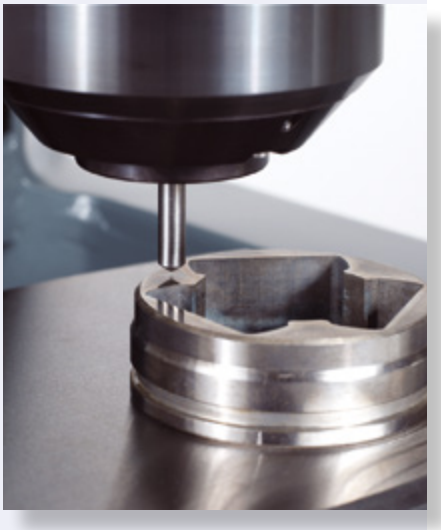
Nose Cone Inserts for DuraJet
As standard the DuraJet is supplied with nose cone insert EMK01 suitable for the following indenters: Rockwell diamond indenter (EMNDR28007Z), Rockwell 1/16" & 1/8" indenters (EMNKW28E16Z, EMNKW28E18U), Brinell 1, 2.5, 5 mm indenters (EMNKW28E01Z, EMNKW28E02Z, EMNKW28E05Z) and Vickers indenter (EMNDV28007Z). If however other indenters are to be used a different nose cone insert must be selected.

Nose Cone Insert, Ø4.5 mm	
Drilling Ø4.5mm. For thin shafted diamond indenters. For DuraJet.	EMK02
Nose Cone Insert, Ø12 mm	
Drilling Ø12mm. For ¼" Rockwell ball indenter (EMNKW28E14U). For DuraJet.	EMK03
Nose Cone Insert, Ø19 mm	
Drilling Ø19mm. For ½" Rockwell ball indenter (EMNKW28E12U). For DuraJet.	EMK04
Test Anvils, V-anvils	
V-anvil 4-10 mm	EMM4TV01
V-anvil 8-20 mm	EMM4TV02
V-anvil 15-55 mm	EMM4TV03
V-anvil 30-220 mm	EMM4TV04
Narrow gage V-anvil 4-10 mm	EMM4TV11
Narrow gage V-anvil 8-20 mm	EMM4TV12
Narrow gage V-anvil 15-55 mm	EMM4TV13
Tiltable anvil, Ø140 mm, +/-5 degrees	EMM4TS01
Cross Slide	EMM4Z523-2
XY cross slide for fine positioning of sample. Size 220 x 100 mm, stroke 120 x 80 mm. Digital read-out (mm / inch), resolution 0.001 mm.	
Other Accessories	
USB Hub	EMZ03
USB 4-port Hub for connection of additional USB (2.0) devices. For DuraJet.	
Serial Data Connecting Kit (USB-RS232)	EMZ04
For connection of RS232 serial cable to the USB port. For data transfer between DuraJet and external PC. Includes USB-RS232 adapter and serial cable. For DuraJet.	
Dust cover for DuraJet	EMZ05

We also supply Test Blocks!
Contact your local Struers representative for details.

Available test methods:

- **Rockwell & Superficial Rockwell according to EN ISO 6508, ASTM E18 and JIS Z 2245**
  HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRP, HRR, HRS, HRV (all methods)
  HR15/30/45N, HR15/30/45T, HR15/30/45W, HR15/30/45X, HR15/30/45Y (all methods)
- **Ball indentation hardness test acc. to ISO 2039-1 (DIN 53456) (plastics test)**
  49.03 N, 132.9 N, 357.9 N, 961 N (all methods)
- **Vickers Depth Difference measurement, HVT (not standardised)**
  HVT5, HVT10, HVT20, HVT30, HVT50, HVT100
- **Brinell Depth Difference measurement, HBT (not standardised)**
  HBT1/5, HBT1/10, HBT1/30, HBT2.5/31.25, HBT2.5/62.5, HBT2.5/187.5, HBT5/125
- **Other non-standardised test methods**
  HR2/10, HR2/20, HR2/40, HR2/120
- **Test method conversion acc to. EN ISO18265, DIN 50150 & ASTM E140**



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Struers' equipment is in conformity with the provisions of the applicable International Directives and their appurtenant Standards. (Please contact your local supplier for details).

Struers' products are subject to constant product development. Therefore, we reserve ourselves the right to introduce changes in our products without notice.

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